

**What is claimed is:**

- 1                   1.     A conversion device for use in an imaging system  
2 comprising:  
3                   a first perforated plate portion forming a plurality of collimator  
4 channels separated by a plurality of thin collimator walls;  
5                   a second perforated plate portion forming a plurality of  
6 scintillator channels separated by a plurality of thin scintillator walls;  
7                   reflective coating applied to the inside scintillator surface of said  
8 plurality of thin scintillator walls; and  
9                   a scintillator material filling said plurality of scintillator  
10 channels.
- 1                   2.     A conversion device for use in an imaging system as in  
2 claim 1 wherein said first perforated plate portion and said second perforated  
3 plate portion are formed from a single perforated plate element.
- 1                   3.     A conversion device for use in an imaging system as in  
2 claim 1 wherein said collimator channels comprise a spacing pitch of less than  
3 or equal to 2mm.
- 1                   4.     A conversion device for use in an imaging system as in  
2 claim 1 wherein said collimator channels comprise a collimator channel width  
3 less than 500 microns.
- 1                   5.     A conversion device for use in an imaging system as in  
2 claim 1 wherein said thin collimator walls comprise a wall thickness of 100  
3 microns.
- 1                   6.     A conversion device for use in an imaging system as in  
2 claim 1 wherein said scintillator material comprises luminescent glass.

1                   7.     A conversion device for use in an imaging system as in  
2 claim 6 wherein said luminescent glass comprises luminescent materials  
3 dispersed in a glassy matrix.

1                   8.     A conversion device for use in an imaging system as in  
2 claim 6 wherein said luminescent glass comprises a glass ceramic containing  
3 crystalline particles.

1                   9.     A conversion device for use in an imaging system as in  
2 claim 1 wherein said scintillator material comprises luminescent polymer.

1                   10.    A conversion device for use in an imaging system as in  
2 claim 9 wherein said luminescent polymer comprises inorganic phosphor  
3 particles suspended in a polymer matrix.

1                   11.    A conversion device for use in an imaging system as in  
2 claim 1 wherein said plurality of thin collimator walls is comprised of a high  
3 atomic number metal.

1                   12.    A conversion device for use in an imaging system as in  
2 claim 1 wherein said first perforated plate portion comprises a perforated copper  
3 plate.

1                   13.    A conversion device for use in an imaging system as in  
2 claim 1 wherein said reflective coating comprises TiO<sub>2</sub>.

1                   14.    A conversion device for use in an imaging system as in  
2 claim 1 wherein said scintillator material comprises a luminescent material that  
3 does not decompose when dispersed in molten glass, said luminescent material  
4 suspended in said molten glass.

1                   15.    A conversion device for use in an imaging system  
2 comprising:

3                   a perforated plate forming a plurality of scintillator channels  
4       separated by a plurality of thin scintillator walls;  
5                   reflective coating applied to the inside scintillator surface of said  
6       plurality of thin scintillator walls; and  
7                   a scintillator material filling said plurality of scintillator  
8       channels.

1                   16.     A method of manufacturing a conversion device for use  
2       in an imaging system comprising:  
3                   perforating a plate element to form a plurality of scintillator  
4       channels separated by a plurality of thin scintillator walls;  
5                   coating an inside surface of said plurality of thin scintillator  
6       walls with a reflective coating; and  
7                   filling said plurality of scintillator channels with a scintillator  
8       material.

1                   17.     A method of manufacturing a conversion device for use  
2       in an imaging system as described in claim 16, wherein said filling said plurality  
3       of scintillator channels comprises:  
4                   placing a scintillator material on said perforated plate element;  
5                   applying a load to said scintillator material such that said  
6       scintillator material is pressed onto said perforated plate element;  
7                   heating said scintillator material to a slumping temperature such  
8       that said scintillator material fills said plurality of scintillator channels.

1                   18.     A method of manufacturing a conversion device for use  
2       in an imaging system as described in claim 16, further comprising:  
3                   grinding said scintillator material such that a scintillator upper  
4       surface is planar with a perforated plate upper surface.

1                   19.     A method of manufacturing a conversion device for use  
2       in an imaging system as described in claim 18, further comprising:

3 grinding said perforated plate upper surface such that a  
4 perforated plate depth is adjusted.

1 20. A method of manufacturing a conversion device for use  
2 in an imaging system as described in claim 16, wherein said filling said plurality  
3 of scintillator channels comprises:

4 forming a block of scintillator material with said perforated  
5 plate element embedded within said block of scintillator material; and

6 grinding said scintillator material such that a scintillator upper  
7 surface is planar with a perforated plate upper surface.

1 21. A method of manufacturing a conversion device for use  
2 in an imaging system as described in claim 16, wherein said scintillator material  
3 only partially fills said perforated plate element such that a scintillator function  
4 is generated by said scintillator material and a collimator function is generated  
5 by an unfilled portion.